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PUBLIC HEALTH REPORTS

VOL. 36 APRIL 29, 1921 No. 17

MALNUTRITION.[1]

By TALIAFERRO CLARK, Surgeon, United States Public Health Service.

Malnutrition is a condition of undernourishment or underweight. It is seen in boys and girls at any period after infancy or in childhood. It is an important condition, very often neglected, and when neglected may lead to serious consequences. It may lay the foundation for poor physical development or ill health in adult life, or may lead to some serious disease like tuberculosis.

How to Recognize Malnutrition.

Children suffering from malnutrition are not only much below normal weight for height but they gain much more slowly than they should. At the ages of 6 to 10 years, when a healthy child gains 4 or 5 pounds a year, they may gain only 1 or 2 pounds, or even none at all; from 12 to 16 years, when healthy children should gain from 6 to 10 pounds a year, they may gain only 2 or 3 pounds.

Children with malnutrition do not all behave the same way. Some are pale, dull, and listless, with dark rings under the eyes, tire easily, and have no ambition for work or play; their work in school is often so poor that they must frequently repeat their grades. Others are nervous and fretful, hard to please and hard to manage; they eat and sleep badly. Still others are overambitious, constantly active, restless; they find it difficult to concentrate.

Why Malnutrition Develops.

Children get into a condition of malnutrition because their growth is not watched. To grow in height and gain regularly in weight is just as much a sign of health in a boy or girl of 9 or 10 as in a baby. Mothers have learned to weigh their babies; they must also learn that it is just as important to weigh their older boys and girls. When children do not grow or gain regularly in weight, something is wrong. If these boys and girls were weighed regularly every month, this condition of malnutrition would be discovered early and not allowed to go on to serious consequences.

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[1] Adaptation of an article originally prepared for the Child Hygiene Section of the United States Public Health Service by Senior Surgeon (R) L. Emmett Holt.

The causes of malnutrition are in most cases not difficult to find. Among the most important are:

1. The child does not get sufficient food.
2. He does not get the right kind of food. He spoils his appetite for simple foods needed for growth, such as milk, cereals, vegetables, etc., by excessive indulgence in candy, sweets, pastry, and other indigestible food.
3. He eats irregularly, between meals, spoiling his digestion by cakes and trash.
4. He bolts his food, never taking time enough at meals to chew his food properly, but washes it down with water.
5. He drinks tea and coffee instead of milk and water.
6. He does not get enough sleep; at 10 or 11 years he does not get to bed until 10 o'clock or after, when he should be in bed at 8 o'clock, and sleep with windows wide open.
7. He suffers from habitual constipation.
8. He gets too much stimulation and emotional excitement—motion pictures and other evening entertainments.
9. He plays too hard—too many hours or in too active and intense a manner.
10. He is overworked in school or out; sometimes he has too many extra lessons or classes outside school hours.
11. Malnutrition may also be caused or aggravated by such things as decayed teeth, enlarged or diseased tonsils or adenoids, and it may be the beginning of some serious disease.
12. In places where malaria or hookworm is present, malnutrition is often the result of these infections.

Malnutrition Should be Treated.

Unless the condition is recognized early and measures are taken to correct it, the effects of malnutrition in childhood may last to adult life. It may show itself as prolonged ill health and feeble resistance to disease; the individual may grow up undersized and underweight, not strong enough to do the average work of a man or woman.

How common the condition of malnutrition is may be shown by the result of the selective draft, where nearly 1 man in 3 of the young men examined was rejected as unfit for active military service. Of those rejected, 40,000 were found unfit because of developmental defects, such as deficient height, weight, chest measurement, or muscular development.

Careful investigations which have been made show that fully 20 per cent of the children in our schools are at present suffering from malnutrition. Is your child one of this number?

What to Do.

In order to prevent malnutrition, or at least to recognize it before serious consequences have followed, the most important thing is, *watch the child's weight!* In the case of older children this can best be done in school, where monthly weights of all children should be taken and recorded, and special attention to those who do not make a normal gain should be given by the parents, teacher, or school nurse or doctor if there is one. It is essential that every child of school age should receive a full medical examination once a year.

A child who is suffering from malnutrition—that is, one who is much below normal weight or one who is steadily losing weight or one who is not making a normal gain—should at once be taken to a physician and examined to see if any disease is developing. In the case of children residing in areas in which malaria or hookworm prevails, the physician should search for the presence of the parasites of these and similar diseases. The child's whole daily life should be carefully gone into to see which of the rules of health he is violating and whether this pertains to his food, his habits of eating, his hours of play, of school work, or of sleep.

Malnutrition is cured by correcting the habits or removing the causes already mentioned upon which it depends. Often it is a matter of enforcing discipline in the home.

Is your child suffering from malnutrition? Compare his weight with the standard which is given on pages 929 and 930.

Some Hints on Feeding Children.

In dealing with malnutrition the following suggestions regarding children's diet may be helpful:

A DIETARY FOR INFANTS.

During early infancy the diet should consist wholly of milk; and since no perfect substitute for mother's milk is known, mothers should always nurse their babies at the breast, unless otherwise advised by a competent physician.

When the baby is from 3 to 5 months old he should be given orange juice. Beginning with a teaspoonful given one hour before the second feeding or nursing time in the earlier months, the amount should be increased until at 6 months of age he is taking two to three tablespoonfuls. Also about the fourth or fifth month, if bottle fed, his milk may be diluted with barley or oatmeal water.

At about 8 months of age he may take cereal gruel, and after he is 9 months old he may be given beef juice and beef tea.

At 10 months he may have crackers, toast, zwieback, strained cereal, and broth made from chicken, beef, or mutton. A month later he may be given strained soup made with fresh vegetables.

Weaning.—As a rule, breast-fed infants should not be weaned until after the tenth month, except on the advice of a competent physician. It is better to continue breast feeding during hot summer time and defer weaning until cooler weather. During the period of weaning, and later, cow's milk should be the principal article of the baby's diet.

At about the fifteenth or sixteenth month, unstrained cereal, potatoes (baked and mashed), cooked fruit, scraped meat, and vegetables (well cooked and mashed) may be added to the baby's diet.

Simple desserts, but slightly sweetened, such as cornstarch, blanc mange, custard, plain rice pudding, and junket, may be given at 18 months.

When the child is between 2 and 3 years of age finely chopped rare beef, chicken, lamb chops, broiled or boiled fish may be given, but in general meat should be given very sparingly to small children during the hot weather. An egg should not be given oftener than once or twice a week.

THE FEEDING OF OLDER CHILDREN.

In considering the diet of older children it must be remembered that food not only supplies the materials essential for growth and the replacing of tissues used up by bodily activities, but also it is the source of body heat and energy. To supply these necessities, the diet should contain fat, carbohydrates, protein, salts, water, and certain intangible food substances known as "vitamines."

The fats are necessary for nutrition and are most readily converted into heat and energy. In addition to cow's milk and cream and butter, the following food substances are rich in fat: Cottonseed oil, peanut butter, oleomargarine, olive oil, and bacon.

The carbohydrates comprise a large proportion of the heat and energy-producing substances in the diet. These are derived from food substances containing sugar and starches, such as the cereals, various forms of breakfast food, potatoes, rice, macaroni, spaghetti, and bread.

The protein substances are necessary for building new tissues and are of both animal and vegetable origin. The foodstuffs rich in protein are lean meat, eggs, chicken, fish, and milk and cheese, and among vegetables, beans and peas.

The salts are necessary for the growing skeleton. These are supplied by milk and are present in meat and eggs, and especially in green vegetables and fruits.

Vitamines.—It is now known that a diet composed only of meat, potatoes, bread, and cereals does not promote the best growth and development of children. Such a diet should be supplemented by an abundance of milk, butter, and the green leafy vegetables, such as spinach, kale, lettuce, Swiss chard, onions, cress, and beet and turnip tops. These articles of food are rich in the growth-stimulating "vitamines." Growing children should partake of them freely.

The diet of the child must be arranged with regard to his age and his ability to digest certain articles of food.

The following foods have been recommended for a child from 2 to 4 years of age.

Milk.

This is the principal article of diet.

Fruits.

Baked apples.
Stewed prunes.
Apple sauce.
Stewed peaches.
Oranges.
Baked pears.
Stewed pears.

Cereals.

Oatmeal.
Cracked wheat.
Samp.
Farina.
Hominy, and other cooked breakfast cereals.

White vegetables.

Potato (baked).
Rice.
Macaroni.
Spaghetti.

Green vegetables.

String beans.
Asparagus.
Lettuce.
Celery (stewed).
Carrots.
Spinach.
Beet greens.
Green peas.
Beets.
Swiss chard.

Bread.

Stale bread (white, whole wheat, graham, oatmeal, rye, or corn) with butter, crackers.

Desserts.

Junket.
Custard.
Tapioca cream.
Apple tapioca.
Prune whip.
Cooked fruit.
Simple jelly.
Sago.
Cornstarch pudding.
Rice pudding (without raisins).
Bread pudding (without raisins).
Ice cream.

Protein foods.

Eggs (soft-boiled or coddled).
Fresh fish (boiled).
Roast chicken.
Boiled chicken.
Mutton.
Steak.
Lamb (roast or chop).
Roast beef.

Soups.

Beef.
Creamed vegetable.
Mutton.
Vegetable.
Chicken.

Fats.

Butter.
Oleomargarine.[1]
Peanut butter.
Olive oil.

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[1] Because of its content of growth-promoting vitamines, butter is to be preferred to oleomargarine as a food for growing children.

For older children up to 12 years of age the following articles of diet have been recommended:

Milk.
Mutton, chicken, beef broth.
Bouillon.
Milk soups.
Soft-boiled eggs.
Dropped eggs.
Scrambled eggs.
Broiled chicken.
Minced meat.
Turkey.
Sweetbreads.
Boiled and broiled fish.
White bread.
French bread.
Whole wheat and graham bread.
Corn cake.
Plain crackers.
Milk toast.
Oatmeal, farina, rice, hominy, and all the other cooked breakfast cereals.
Cracked wheat.
Shredded wheat biscuit.
Baked, mashed, boiled potato.
Stewed potato.
Plain macaroni and spaghetti.
Bacon.
Raw and steamed oysters.
Butter.
Common cheese.
Shell, lima, and string beans.
Asparagus, spinach, beet greens.
Peas.
Plain omelet.
Lamb and mutton chops.
Beefsteak.
Roast lamb and mutton.
Boiled mutton.
Roast beef.
Roast chicken.
Summer squash.
Winter squash and pumpkin.
Celery, tomatoes, beets.
Carrots, lettuce, onions, and green corn.
Parsnips.
Cocoa.
Bread pudding.
Rice pudding.
Tapioca.
Sago.
Blanc mange.
Ice cream.
Baked apples.
Stewed prunes.
Stewed figs.
Raw apples.
Figs.
Apple sauce.
Pears and peaches.
Grapes and oranges.
Grape fruit.
Bananas.
Strawberries.
Raspberries.
Blueberries.
Blackberries.
Junket.
Baked custard.
Cornstarch pudding.

Height and Weight Table for Boys.

ABOUT WHAT A BOY SHOULD GAIN EACH MONTH.

Age:	Ounces.	Age:	Ounces.
5 to 8	6	12 to 16	16
8 to 12	8	16 to 18	8

Height (inches).	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.
39	35	36	37	......	......	......	......	......	......	......	......	......	......	......
40	37	38	39	......	......	......	......	......	......	......	......	......	......	......
41	39	40	41	......	......	......	......	......	......	......	......	......	......	......
42	41	42	43	44	......	......	......	......	......	......	......	......	......	......
43	43	44	45	46	......	......	......	......	......	......	......	......	......	......
44	45	46	46	47	......	......	......	......	......	......	......	......	......	......
45	47	47	48	48	49	......	......	......	......	......	......	......	......	......
46	48	49	50	50	51	......	......	......	......	......	......	......	......	......
47	......	51	52	52	53	54	......	......	......	......	......	......	......	......
48	......	53	54	55	55	56	57	......	......	......	......	......	......	......
49	......	55	56	57	58	58	59	......	......	......	......	......	......	......
50	......	......	58	59	60	60	61	62	......	......	......	......	......	......
51	......	......	60	61	62	63	64	65	......	......	......	......	......	......
52	......	......	62	63	64	65	67	68	......	......	......	......	......	......
53	......	......	......	66	67	68	69	70	71	......	......	......	......	......
54	......	......	......	69	70	71	72	73	74	......	......	......	......	......
55	......	......	......	......	73	74	75	76	77	78	......	......	......	......
56	......	......	......	......	77	78	79	80	81	82	......	......	......	......
57	......	......	......	......	......	81	82	83	84	85	86	......	......	......
58	......	......	......	......	......	84	85	86	87	88	90	91	......	......
59	......	......	......	......	......	87	88	89	90	92	94	96	97	......
60	......	......	......	......	......	91	92	93	94	97	99	101	102	......
61	......	......	......	......	......	......	95	97	99	102	104	106	108	110
62	......	......	......	......	......	......	100	102	104	106	109	111	113	116
63	......	......	......	......	......	......	105	107	109	111	114	115	117	119
64	......	......	......	......	......	......	......	113	115	117	118	119	120	122
65	......	......	......	......	......	......	......	......	120	122	123	124	125	126
66	......	......	......	......	......	......	......	......	125	126	127	128	129	130
67	......	......	......	......	......	......	......	......	130	131	132	133	134	135
68	......	......	......	......	......	......	......	......	134	135	136	137	138	139
69	......	......	......	......	......	......	......	......	138	139	140	141	142	143
70	......	......	......	......	......	......	......	......	......	142	144	145	146	147
71	......	......	......	......	......	......	......	......	......	147	149	150	151	152
72	......	......	......	......	......	......	......	......	......	152	154	155	156	157
73	......	......	......	......	......	......	......	......	......	157	159	160	161	162
74	......	......	......	......	......	......	......	......	......	162	164	165	166	167
75	......	......	......	......	......	......	......	......	......	......	169	170	171	172
76	......	......	......	......	......	......	......	......	......	......	174	175	176	177

[Table copyright by Child Health Organization.]

Height and Weight Table for Girls.

ABOUT WHAT A GIRL SHOULD GAIN EACH MONTH.

Age:	Ounces.	Age:	Ounces.
5 to 8	6	14 to 16	8
8 to 11	8	16 to 18	4
11 to 14	12		

Height (inches).	5 yrs.	6 yrs.	7 yrs.	8 yrs.	9 yrs.	10 yrs.	11 yrs.	12 yrs.	13 yrs.	14 yrs.	15 yrs.	16 yrs.	17 yrs.	18 yrs.
39	34	35	36	......	......	......	......	......	......	......	......	......	......	......
40	36	37	38	......	......	......	......	......	......	......	......	......	......	......
41	38	39	40	......	......	......	......	......	......	......	......	......	......	......
42	40	41	42	43	......	......	......	......	......	......	......	......	......	......
43	42	42	43	44	......	......	......	......	......	......	......	......	......	......
44	44	45	45	46	......	......	......	......	......	......	......	......	......	......
45	46	47	47	48	49	......	......	......	......	......	......	......	......	......
46	48	48	49	50	51	......	......	......	......	......	......	......	......	......
47	......	49	50	51	52	53	......	......	......	......	......	......	......	......
48	......	51	52	53	54	55	56	......	......	......	......	......	......	......
49	......	53	54	55	56	57	58	......	......	......	......	......	......	......
50	......	......	56	57	58	59	60	61	......	......	......	......	......	......
51	......	......	59	60	61	62	63	64	......	......	......	......	......	......
52	......	......	62	63	64	65	66	67	......	......	......	......	......	......
53	......	......	......	66	67	68	68	69	70	......	......	......	......	......
54	......	......	......	68	69	70	71	72	73	......	......	......	......	......
55	......	......	......	......	72	73	74	75	76	77	......	......	......	......
56	......	......	......	......	76	77	78	79	80	81	......	......	......	......
57	......	......	......	......	......	81	82	83	84	85	86	......	......	......
58	......	......	......	......	......	85	86	87	88	89	90	91	......	......
59	......	......	......	......	......	89	90	91	93	94	95	96	98	......
60	......	......	......	......	......	......	94	95	97	99	100	102	104	105
61	......	......	......	......	......	......	99	101	102	104	106	108	109	111
62	......	......	......	......	......	......	104	106	107	109	111	113	114	115
63	......	......	......	......	......	......	109	111	112	113	115	117	118	119
64	......	......	......	......	......	......	......	115	117	118	119	120	121	122
65	......	......	......	......	......	......	......	117	119	120	122	123	124	125
66	......	......	......	......	......	......	......	119	121	122	124	126	127	128
67	......	......	......	......	......	......	......	......	124	126	127	128	129	130
68	......	......	......	......	......	......	......	......	126	128	130	132	133	134
69	......	......	......	......	......	......	......	......	129	131	133	135	136	137
70	......	......	......	......	......	......	......	......	......	134	136	138	139	140
71	......	......	......	......	......	......	......	......	......	138	140	142	143	144
72	......	......	......	......	......	......	......	......	......	......	145	147	148	149

Weights and measures should be taken without shoes and in only the usual indoor clothes.
[Table copyright by Child Health Organization.]

A GUIDE TO THE PROPER RAT-PROOFING OF BUILDINGS.

By C. E. Hauer, Chief Sanitary Inspector, United States Public Health Service.

Since bubonic plague is primarily a disease of rodents, and only secondarily a human infection, the destruction of the rodent population, as far as possible, is a measure of first importance in any plague-eradicative campaign. This measure is usually carried out in three ways; namely, intensive trapping, poisoning, and rat-proofing of all buildings. The first two measures are most important in the early part of a campaign, and by these means thousands of rodents may be quickly destroyed. Yet, only temporary results can be expected from these two methods. On the other hand, the slower process of rat-proofing gives more lasting results. However, it must be remembered that no community as yet has ever been freed of rodents by any measure or combination of measures, and the most that can be expected is to keep the rodent population at an irreducible minimum.

The first step to be taken in a community is, of course, the passage of a rat-proofing ordinance; then, intelligent supervision of all work